the cause of industrial betterment and municipal improvement, as well as nursing, and her name is guarantee of the excellence of her work.

Miss Palmer, an American nurse, is also a journalist, and is very active in all matters of civic reform, and, being connected with many societies, has a wide field for work and influence.

There is a very general movement among nurses to study parliamentary law, sociology, and modern movements, and this with a view of entering reform work. Two local groups, the Metropolitan Club and Johns Hopkins Hospital Training-School Alumnæ, belong to the Federation of Women's Clubs.

Nurses are by their training especially fitted for reform and preventive work, and each succeeding year finds a larger number employed outside of what might be considered strictly professional lines. That their work has been acceptable is proven by their services being sought after. They have always been found ready to help in all forward movements, and are glad to work shoulder to shoulder and in hearty accord with any and all societies whose aims are the improvement of conditions of the half who know not how to live.

LEAVES FROM THE NOTE-BOOK OF A BELLEVUE NURSE

LECTURE IV.—KIDNEYS AND URINE

(Continued from page 502)

We now come to the subject of excretions proper. An excretion, as we have learned, is a substance that exists preformed in the body, and is carried by the blood to certain organs and taken from the blood by these organs and thrown from the body. Excretion is continuous, and not intermittent, like secretion. It is principally composed of effete matter, the result of the growth of tissue.

True Excretions.

(1) Urine; (2) Perspiration; (3) Bile, partly.

The urine is excreted by the kidneys, which are two in number and consist of two distinct parts, (1) cortical substance and (2) medullary substance. The external or cortical substance is composed of tortuous tubes, at the end of which are small rounded bodies called Malpighian bodies, blood-vessels, etc. The internal pyramidal or medullary substance is chiefly composed of straight tubes and blood-vessels, lying internal to the cortical. These different tubes become filled with epithe-

lium, albuminoid matter, blood, etc., and in disease are washed out by the urine and can be seen under the microscope in the exact shape of the tubes from which they come. The arrangement of the Malpighian bodies is as follows: In the Malpighian bodies the secretion of water occurs. In the tubes of Henle the excrementitious matter is excreted (urea). The water dissolves the urea and washes it out into the bladder. The kidneys are plentifully supplied with blood-vessels. Those going into the kidney carrying urea and effete matter are known as afferent vessels, and those vessels which come from the kidney are known as efferent. Anything that increases the blood-pressure in the kidneys increases the urine, and vice versa. The urine comes from the kidneys into the pelvis and thence through the ureter, a tube running from the kidneys to the posterior part of the bladder. From the ureter the urine enters the bladder and is discharged from this through the urethra. The bladder is a sac just behind the symphysis pubis for the reception of urine, and holds ordinarily one pint, but will, if distended, hold much more. It is composed of three coats, serous, muscular, and mucous membrane. It empties itself by means of the muscular coat. Incontinence is inability to retain urine, due in some cases to paralysis of the walls of the bladder. Suppression is when the kidneys do not act or do not secrete urine. In catheterizing, two things are necessary, cleanliness and gentleness. Use a soft, flexible rubber catheter, one that is clean, and wash the parts of the body thoroughly with antiseptic solutions. The catheter is to be inserted about two to three inches. In regard to the urine, note quantity, appearance as to color, transparency and odor, reaction and sediment. In saving specimens of urine, if it is to ascertain the quality of substance, six to eight ounces of urine should be saved three or four hours after eating. If for finding quantity of substance, there should be some of all the urine which has been passed in twenty-four hours saved and kept in a dry, cool place. The bottle should be corked. Urine will often change in appearance, due to bacteria, moisture, and temperature. In testing urine there are six important things to notice, viz.: (1) Quantity, (2) color, (3) odor, (4) transparency, (5) specific gravity, (6) chemical reaction.

(1) *Quantity* is from thirty ounces to fifty ounces in twenty-four hours, but this may be decreased or increased, depending upon exercise, activity of the skin, and character of the food. Also disease affects the amount of urine. In persons having small, contracted kidneys there is often as much as one hundred and fifty ounces passed in twenty-four hours; also in diabetes mellitus. In the large white kidney there is often as little as fifteen ounces passed. Epilepsy and hysteria increase the amount.

(2) *Color.*—The color varies from a pale yellow to reddish yellow. This is also affected by food, drink, disease, etc. The coloring matter of urine is "urobilin." In typhoid fever the urine is rather a blue color, in malaria dark, in carbolic poisoning black. Rhubarb and senna will turn it dark brown. Methylen blue turns urine blue.

(3) *Odor.*—The normal odor is due to phenylic acid, but may be ammoniacal or putrid, if allowed to remain in the bladder or to stand. The latter is due to mucus or organic substances, as in cystitis. Odor may be modified by turpentine, which gives the odor of violets. Asparagus or vegetable diet gives a different odor. Diabetic urine has a sweetish odor.

(4) *Transparency.*—Urine may be clear, or after standing have clouds, due to the presence of mucus, or perhaps of pus, bacteria, phosphates, or urates. Some of the tests are: by putting cloudy urine in a test-tube and heating the upper layer of urine the cloud may disappear, proving it to be due to urates. But if it does not disappear until nitric acid be added, we know the cloudiness was due to phosphates. If no disappearance, then there is suspicion of albumin.

(5) *Specific Gravity.*—The specific gravity is the total amount of solids in solution in the urine. Water at 60° F. equals 1000 by the urinometer; now, by adding solids we can raise the specific gravity to 1000 or 1010 or even 1040. Normal specific gravity is from 1018 to 1025. But in diabetes it goes up to 1040. A large amount of watery secretion lessens the specific gravity.

(6) *Chemical Reaction.*—This may be acid, alkaline, or neutral. Normal urine is slightly acid, turning blue litmus-paper red. If the alkalinity is fixed, the litmus paper will stay red. Alkalinity is due to alkali of potassium or sodium. Acidity is due to acid sodium phosphates. Ammoniacal urine is alkaline.

The constituents of urine are: *Organic*—urea, uric acid, coloring mater; *Inorganic*—sulphates, carbonates, chlorides.

Organic Constituents.

Urea is effete matter derived from tissues, a result of tissue waste taken up by lymph and blood and carried to the kidneys, and is excreted by the kidneys and sweat-glands. The quantity of urea in urine is from three hundred to six hundred grains in twenty-four hours. The chief organic principle is uric acid, of which there are six or seven grains in twenty-four hours. This in urine may be compared to albumin, as in gastric digestion. The coloring matter is urobilin, and is derived from the bile and blood, and increases in color in fevers. Uric acid is a transitional product between waste of tissues and urea.

Inorganic Principles.

Sulphates are in urine, as in blood, in small quantities; there are few carbonates.

Phosphates appear in two forms—the earthy, soluble in alkaline solutions, and the non-earthy, soluble in acids.

Chlorides, most abundant, disappear almost in febrile cases.

Urine contains (1) albuminoids or proteids and (2) carbohydrates, as glucose or grape sugar, this appearing largely in diabetes.

In the first division there are found (3) serum albumin, (4) serum globulin, (5) fibrin. Hemoglobin when red corpuscles are destroyed, as in malarial fever. There are three tests for albumin in urine: (1) Heat and nitric acid, or heat alone; (2) nitric acid; (3) chloride of sodium and acetic acid, the last way being greatly preferred. There are also three tests for glucose, or grape sugar: (1) Fehling's; (2) bismuth; (3) ferment, the latter being the most reliable..

(To be continued.)

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